HDL®

User manual

Multi function Sensor

SB-CMS-12 in1

buspro

www.hdlautomation.com

INDEX

1. Overview 1
1.1 General Information 1
1.1.1 Description 1
1.1.2 Mounting 1
1.2 Functionnalities Description 2
1.3 Device Description 2
2. Safety Instructions 3
3. Technical Data 3
4. Installation 4
4.1 Wiring 4
4.2 HDL Bus Pro Description 4
4.3 Commissioning 5
5. Software Configuration 5
5.1 Basic setting 5
5.1.1 Change the ID of the device 5
5.1.2 LED Indicators Settings 6
5.2 IR Transmitter 6
5.3 IR Receiver 7
5.4 Sensors setting 8
5.4.1 Basic Info 8
5.4.2 Constant Lux function 9
5.4.3 Adjust Lux Sensor 9
5.5 Logic Relation 9
5.5.1 Logic Information 10
5.5.2 Further Settings of Current Logic 11
5.5.3 Relation 12
5.5.4 Trigger targets 12
5.5.5 Application 13
5.6 Security function 16
5.7 Relay Settings 16
5.7.1 NormalMode 17
5.7.2 Cycle Mode 17
5.7.3 Change Modes 17
5.8 Simulate Test 18
6. NOTES ..... 错误！未定义书签。

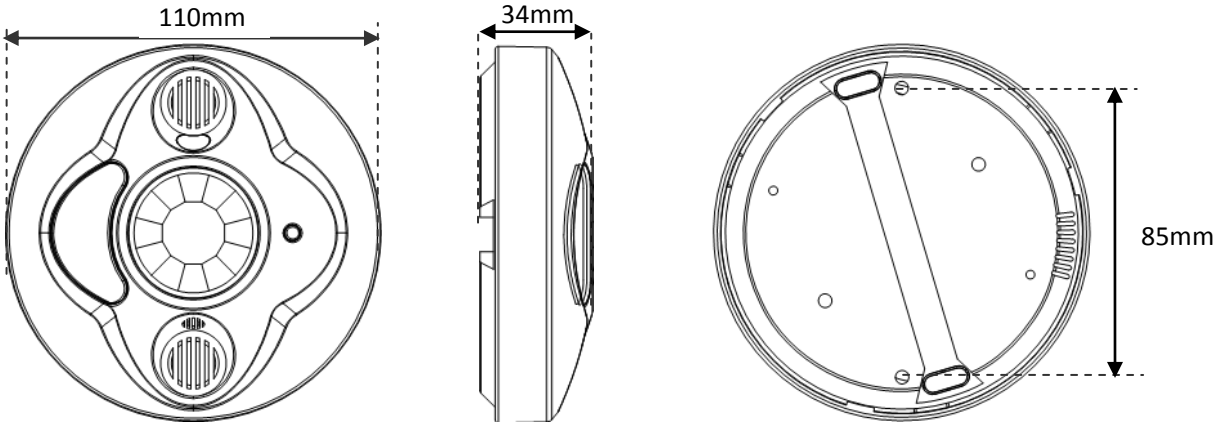
1. Overview

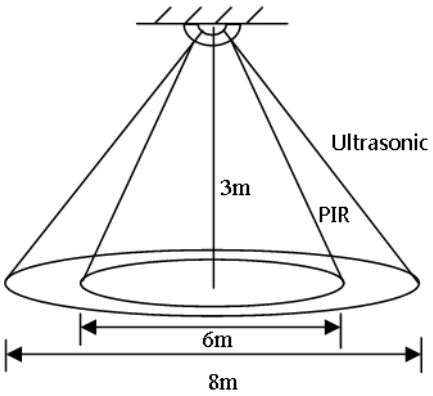
1.1 General Information

1.1.1 Description

12in1sensor includes temperature sensor, PIR motion sensor, LUX sensor, ultrasonic sensor, dry contacts, IR received, IR emitter, 2CH 5A relay output and logic block. The logic block can combine all sensors for different applications. It supports HDL security function.

1.1.2 Mounting





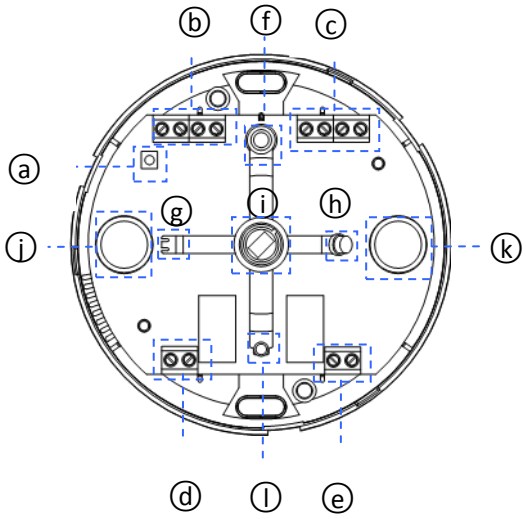
Detect range

- Celling mount Installation

1.2 Functionnalities Description

- Temperature, Lux, IR motion, Ultrasonic, 2 dry contact input, 2 external inputs
- 2 logic relations: OR、AND
- 24 logic blocks function, maximum 9 logic inputs, up to 20 control targets in each logic block
- 2CH 5A Relay output
- Build PID for constant LUX control
- Up to 40 IR receiving control targets
- Up to 240 IR sending control targets
- Maximum 24 programmable logic blocks
- Security function, work with the security module
- Supports upgrade from HDL BUS

1.3 Device Description



ⓐ. Programming button
ⓑ. Dry contact 1、2
ⓒ. HDL - Buspro
ⓓ. Relay output
ⓔ. Relay output
ⓕ. LUX sensor
ⓖ. Temp sensor
ⓗ. IR Emitter
ⓘ. PIR sensor
ⓙ. Ultrasonic sensor
ⓚ. Ultrasonic sensor
ⓛ.LED indicator

2. Safety Instructions

- Screw down strength is less than 0.1Nm.
- Do not make wrong connection on Bus interface, it will damage the Bus interface of thismodule.
- Do not get AC power into Bus wire, it will damage all devices in the system.
- Avoid contact with liquids or corrosive gases.

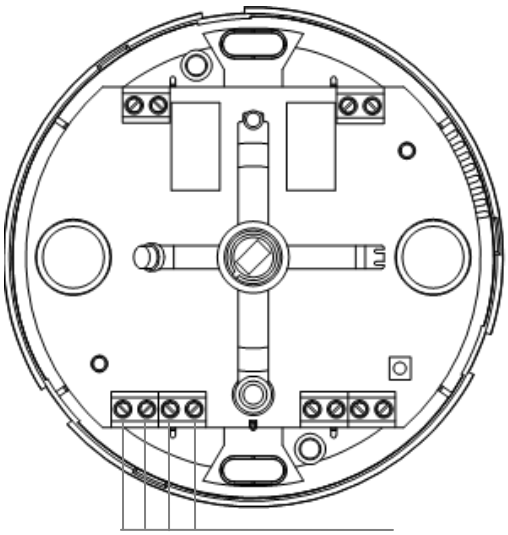
3. Technical Data

Electric Parameters:	
BUS power supply	DC12-30V
Static power consumption	40mA/DC24V
Dynamic power consumption	90mA/DC24V
Range of temperature sensor	-20℃to 60℃
IR transmit frequency	38KHz
IR emission distance	4m
Illumination detection range	0-5000Lux
PIR sensing range in diameter	6m (install height-3m)
Ultrasonic sensor in diameter	8m
Environmental Conditions:	
Working temperature	0℃~45℃
Working relative humidity	40%~98%
Storage temperature	-20℃~+60℃
Storage relative humidity	10%~93%
Approved	
CE	
RoHS	

Production information：	
Dimensions	110(Diameter)×33(mm)
Weight	206.7(g)
Housing material	Lens, ABS
Installation	Ceiling mount
Protection degree	IP20

4. Installation

4.1 Wiring



HDL Buspro

4.2 HDL Bus Pro Description

Connector Information

buspro	
DC24V	Red
COM	Black
DATA -	White
DATA +	Yellow

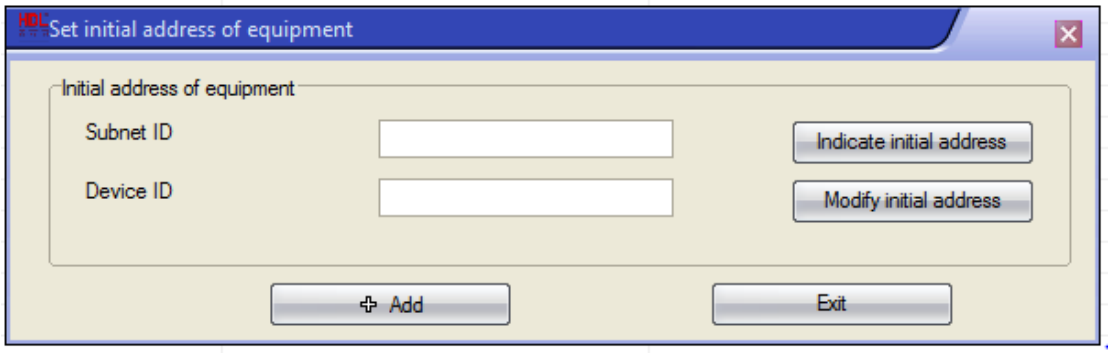
4.3 Commissioning

Method One:

a) open the HDL-BUS Pro Setup tool.

b) keep pressing the programming button for 3 seconds, it turns to red color.

c) on the software, click the “Address management”, and select the “Modify address (when device button is pressed)”, it will show a window like this:



d) click the “Indicate initial address”, then it will show the ID of this device. If you want to modify the address, fill in the new address, and click the “Modify initial address”. Click the “+Add” button, the device will be add in “ON-line devices” list.

Method Two:

a) open the HDL-BUS Pro Setup tool.

b) click the search button, it will show a new window, click fast search button,search the online devices. Click the “Add all”button, the devices which be searched will be added in “ON-line devices” list.

5. Software Configuration

5.1 Basic setting

5.1.1 Change the ID of the device

Every HDL-BUS device has one Subnet ID and one Device ID, the Device ID should be unique in its subnet and the Subnet ID should be kept consistent with the Gateway (typically the SB-DN-1IP or HDL-MBUS01IP.431).

5.1.2 LED Indicators Settings

Enable or disable the PIR/Ultrasonic LED indicator. If enable, the LED indicator will turn red when the PIR detects movement, or the same indicator will turn green when the ultrasonic sensordetects movement.

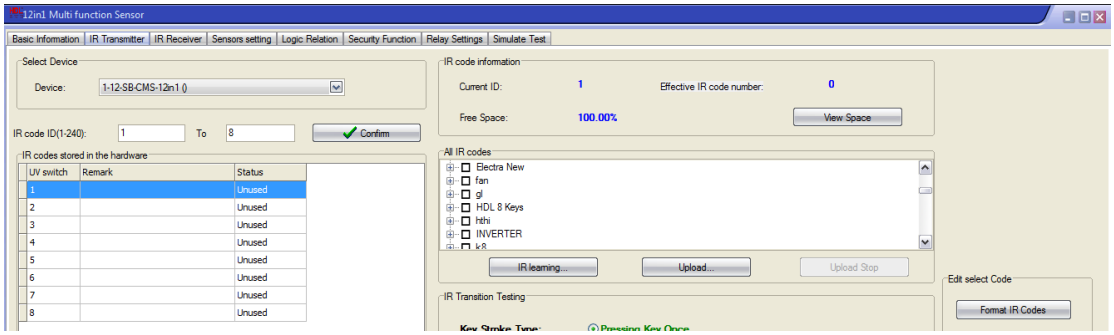
5.2 IR Transmitter

12in1 has an IR (infrared) Transmitter, which can be used to control TV, DVD, AC (IR controlled) etc, to replace your normal remotes.

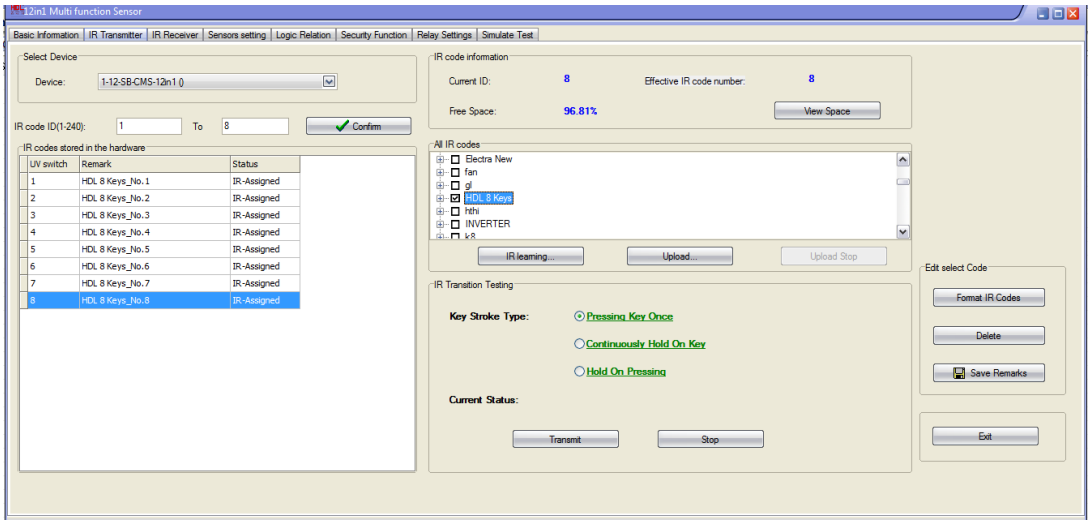
You need an IR learnerto learn and upload the IR codes of your normal remote to the 12in1, also there are some codes have been stored in the HDL BUS setup tool, can view them in ‘All IR Codes’ window.

If now you want to upload some codes to the 12in1, e.g.HDL8 keys code, can follow these steps:

a) input a range for the IR code ID, here is 1 to 8, click ‘Confirm’



b) select ‘HDL8 Keys’ in‘All IR Codes’ window, click ‘Upload’, these codes will be shown in ‘IR codes stored in the hardware’ list, and the key status will change to ‘IR-Assigned’.



Tips: when use buttons to control 12in1 to send out codes,set ‘key type’ as universal switch and set the parameter1(Switch no.) correspond to the UV switch number in 12in1, and the parameter2(Switch Status) is ON.

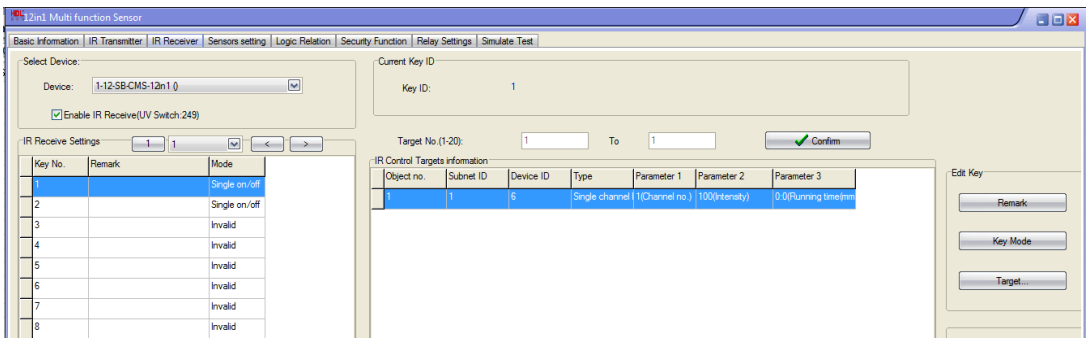
Format IR Codes:All the IR codes in the 12in1 will be deleted.

Delete：Delete the IR code that is selected.

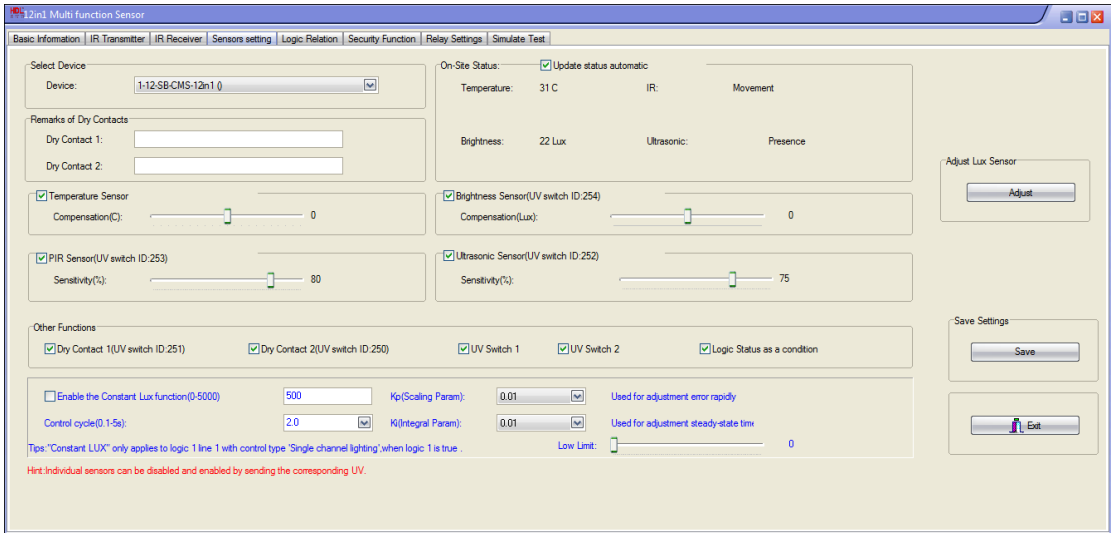
5.3 IR Receiver

Can send UV switch 249 ‘ON’ command to enable the IR Receiver, or ‘OFF’ to disable from panel or other devices. Generally it works with HDL’s IR/RFRemote Controller (HDL-MTIRW), which has built-in HDL self-defined IR codes, can control HDL panels/sensors directly, no need to learn IR codes.12in1 can support up to 5 pages, 40 keys in total.

For below setting, when press the first button in page 1, it will trigger the dimmer/relay(1-6) to turn on/off channel1.



5.4 Sensors setting



5.4.1 Basic Info

- Remarks of dry contacts

Remarks are recommended, you may make remarks according to the installation places

- On-Site Status

You can check the real-time values of sensors by refreshing or enable ‘Update status automatic’

- Compensation

You can adjust the temp/lux sensors by giving them compensation values, according to the environment of your installation place.

- Sensitivity

Give the PIR/Ultrasonic sensors proper sensitivity to avoid the wrong trigger

- Other Functions

Enable the conditions you need here, they are: dry contact1/2, UV switch 1/2 and logic status as a condition

- UV Switch ID

The sensors and dry contacts have different UV switch ID, send the corresponding UV Switch ID ‘ON’ to enable it, and ‘OFF’ to disable it from panel or other devices.

5.4.2 Constant Lux function

Using Constant Lux function, the light will dim down if, say the sun comes out of the cloud, and the light will bright up if the sun hides behind the cloud again, in a word, you can get a constant brightness(lux).

-Kp

The larger the factor is, the more sensitive it is, but the 'ruder' output it may produce, especially when the 'control cycle' is very short.

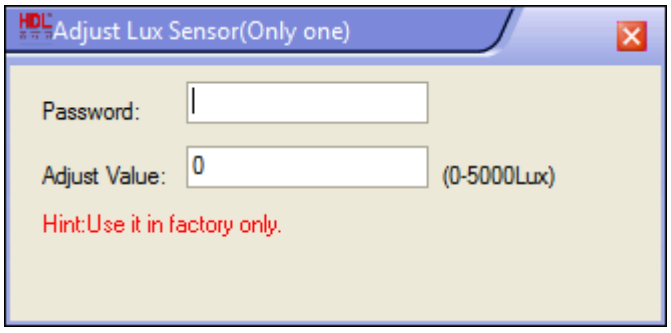
- Ki

The smaller the factor is, the more accurate final output it can provide.

5.4.3 Adjust Lux Sensor

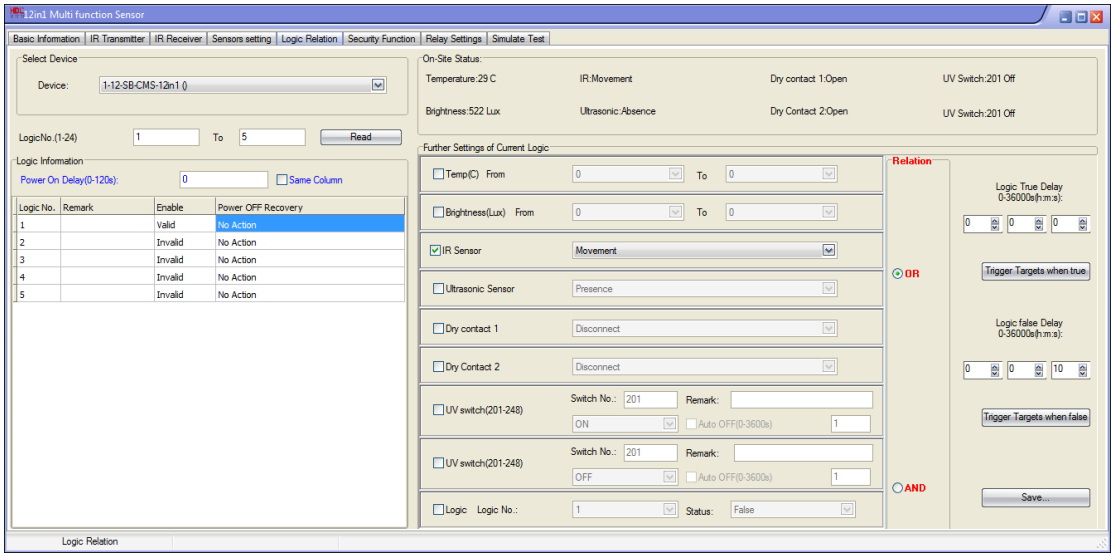
It's adjusted by HDL, normally not recommended to adjust again unless it's quite incorrect.

Password：85521566



5.5 Logic Relation

You can set up to 24 logics and in each logic you can combine up to 9 inputs (conditions), trigger up to 20 targets when the logic is true and another 20 targets when false.



5.5.1 Logic Information

- Power On Delay (0-120s)

This parameter is specially designed for ‘Power OFF Recovery’ (if you select ‘true’ in the ‘Power OFF Recovery’, you may get jam on the bus when initializing. you can set ‘Power On Delay’ to avoid this.)

-Same Column

when enabled, you can change the properties of all logics together(‘remarks’, ‘Enable’, ‘Power OFF Recovery’)

-Logic No.

up to 24, you can make some remarks

-Enable

You can enable or disable one logic here

-Power OFF Recover

Set the logic status of power on. You can set it as:

No Action：no action when power on;

Power-off status：go back to the status before power off;

True：Set the logic as True when power on;

False：Set the logic as False when power on;

- On-Site Status

Show the value detected by sensors

5.5.2 Further Settings of Current Logic

There are 9 conditions, select the conditions you need. The details are as follows.

-Temperature (°C)

Condition is satisfied when the temperature is in the range you set.

Setting Range： - 20°C~60°C

- Brightness(Lux)

Condition is satisfied when the brightness is in the range you set.

Setting Range：0~5000

-IR sensor

can set ‘movement’ or ‘no movement’ as a condition.

-Ultrasonic sensor

can set ‘present’ or ‘absence’ as a condition.

- Dry Contact 1

Use the dry contact 1 as a condition.

Disconnect：Take open circuit as a satisfied condition.

Connect：Take short circuit as a satisfied condition.

-Dry Contact 2

Use the dry contact 2 as a condition.

-UV switch (201 - 248)

Use UV switch as a condition. The range of the UV switch no. is 201-248, and the status can be on or off.

Auto OFF (0~3600S)：If this option is selected, the status of the UV switch will go off automatically every time it is satisfied after the time you set. The range of the time that can be set is 0~3600S.

-Logic

You can take the status (true of false) of other logic as a condition. (can't be the logic of itself)

5.5.3 Relation

If more than one conditions are selected, you can set the logic relationship between them as 'AND' or 'OR'.

- AND

Only when all the conditions are satisfied, the logic is 'true' ;

-OR

Once one condition is satisfied, the logic is 'true'.

5.5.4 Trigger targets

No matter the logic is true or not, you can trigger the targets you want.

-Logic true delay

When the logic is true, you can choose to delay some certain time before triggering targets.

- Trigger targets when true

you can set up to 20 targets to trigger.

- Logic false delay

When the logic is false, you can choose to delay some certain time before triggering targets.

-Trigger targets when false

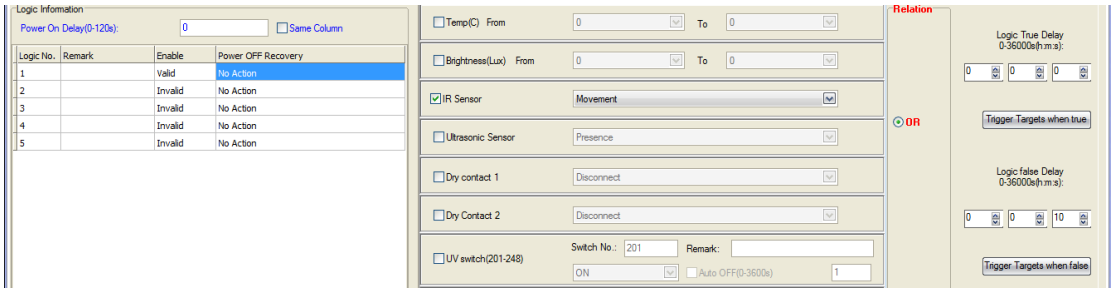
When the logic is false, you can set up to 20 targets to trigger.

5.5.5 Application

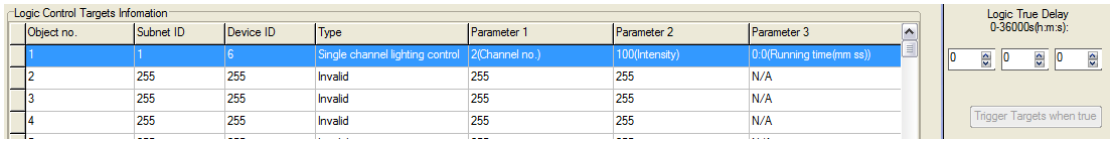
- Application1

Turn on light when detects movement, and turn it off when no movement after 10s.

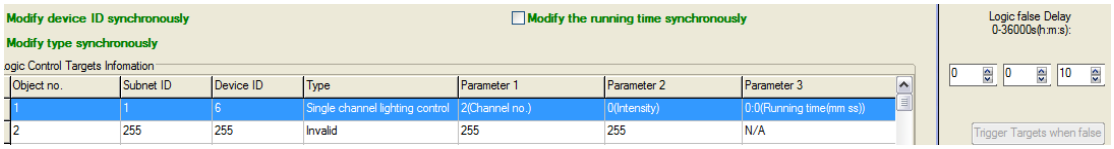
a) Enable logic No.1, set IR Sensor - Movement as the condition



b) Logic true delay is 0s, in ‘trigger target when true’ window, input dimmer/relay ID, here is 1-6, parameter 1 is channel 2, parameter 2 is 100.


Logic Control Targets Infomation
Object no.
Subnet ID
Device ID
Type
Parameter 1
Parameter 2
Parameter 3
1 1 6 Single channel lighting control 2(Channel no.) 100(Intensity) 0:0(Running time(mm ss))
2 255 255 Invalid 255 255 N/A
3 255 255 Invalid 255 255 N/A
4 255 255 Invalid 255 255 N/A
Logic True Delay 0-36000s(h:m:s):
Trigger Targets when true

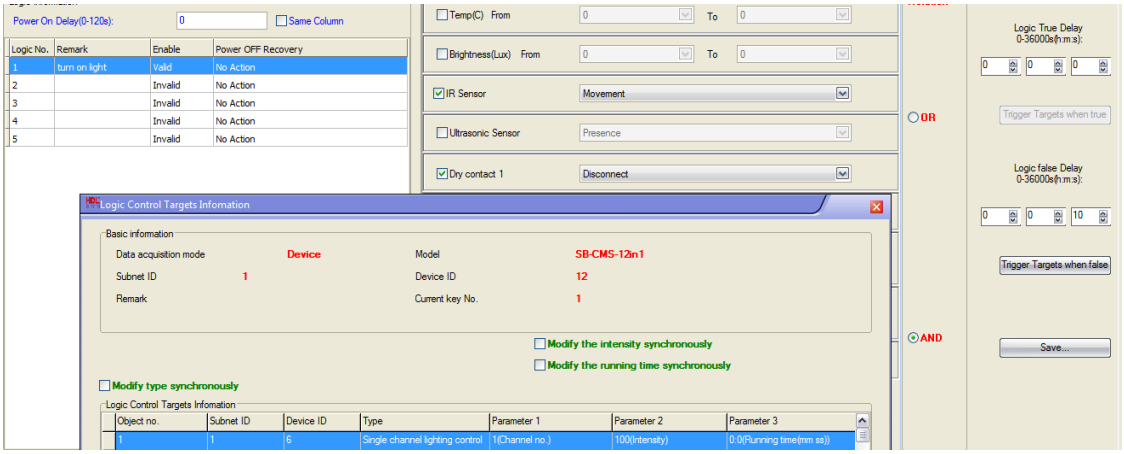
c) Logic false delay is 10s, in ‘trigger targets when false’ window, turn off corresponding device channel 2.



- Application2

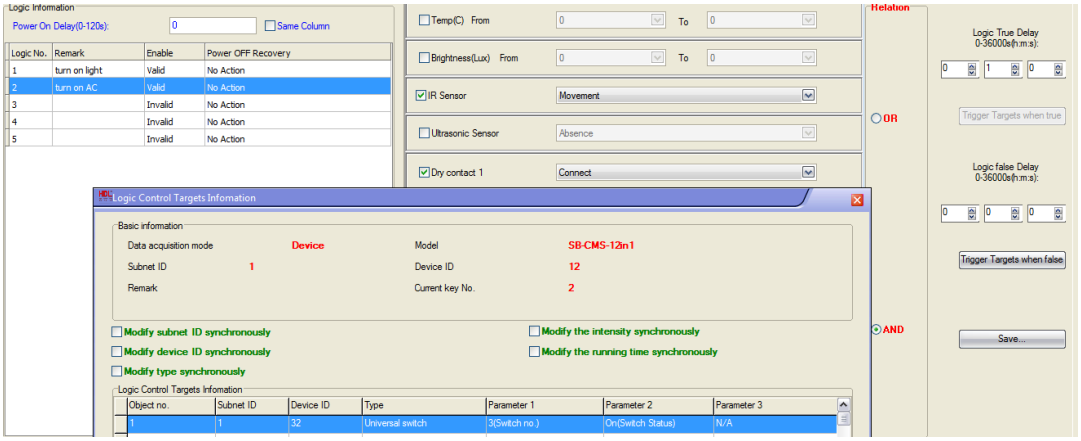
a) When people open the door and come into the meeting room, turn on the lights automatically:

Set IR Sensor - ‘Movement’ and dry contact1(Suppose dry contact 1 has been connected with a magnetic contact and used to detect the door status) - ‘Disconnect’ as input conditions, and the relation for the logic is ‘AND’, turn on dimmer(1-6) channel1 when true.

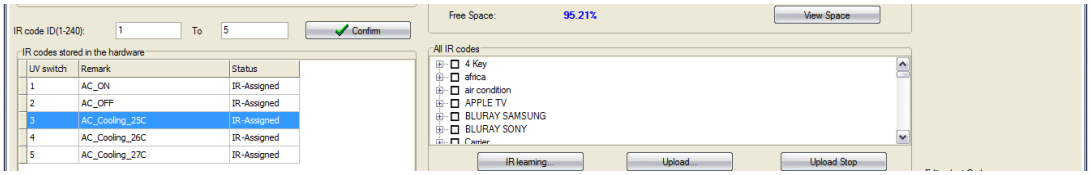


b) After 1 minute turn on the AC and set the temperature as 25℃:

Set IR Sensor - 'Movement' and dry contact1 - 'Connect' as input conditions, and the relation for the logic is 'AND', delay time is 1 min, turn on AC when true.

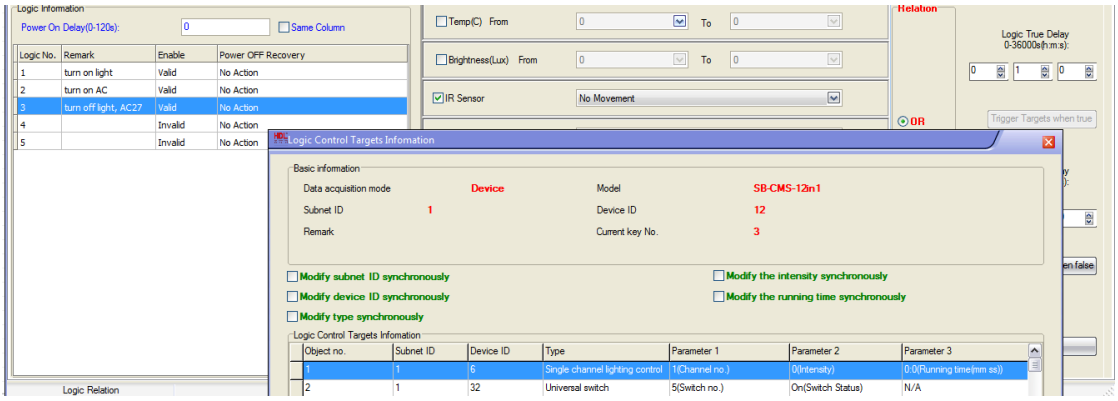


Can check the UV Switch No. from IR Emitter, here 25℃ is UV Switch 3.

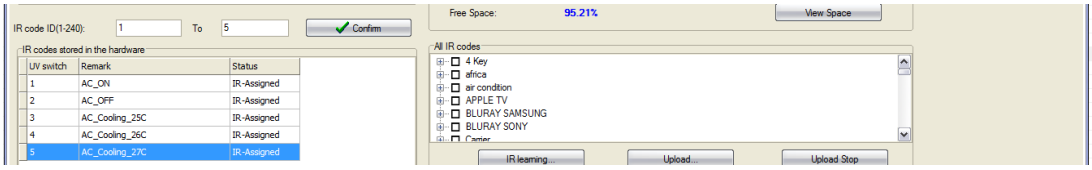


c) 1 minute after people left the room, turn off the lights and set temperature as 27℃:

Set IR Sensor - 'No Movement', delay time is 1 min, turn off light(1-6) channel1 and AC go to 27℃ when true.

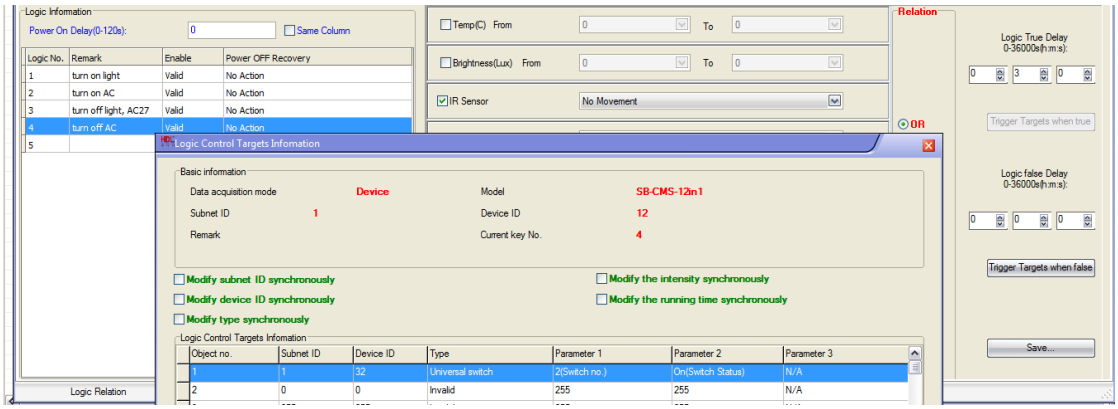

Logic Information
Power On Delay(0-120s):
Same Column
Logic No. Remark Enable Power OFF Recovery
1 turn on light Valid No Action
2 turn on AC Valid No Action
3 turn off light, AC27 Valid No Action
4 Invalid No Action
5 Invalid No Action
Logic Relation
Temp(C) From To
Brightness(Lux) From To
IR Sensor No Movement
Relation
OR
Logic True Delay 0-36000s(h:m:s):
Trigger Targets when true
Logic Control Targets Infomation
Basic information
Data acquisition mode Device
Model SB-CMS-12in1
Subnet ID 1
Device ID 12
Remark
Current key No. 3
Modify subnet ID synchronously
Modify device ID synchronously
Modify type synchronously
Modify the intensity synchronously
Modify the running time synchronously
Logic Control Targets Infomation
Object no. Subnet ID Device ID Type Parameter 1 Parameter 2 Parameter 3
1 1 6 Single channel lighting control 1(Channel no.) 0(Intensity) 0.0(Running time(mm ss))
2 1 32 Universal switch 5(Switch no.) On(Switch Status) N/A

Can check the UV Switch No. from IR Emitter, here 27℃is UV Switch 5.

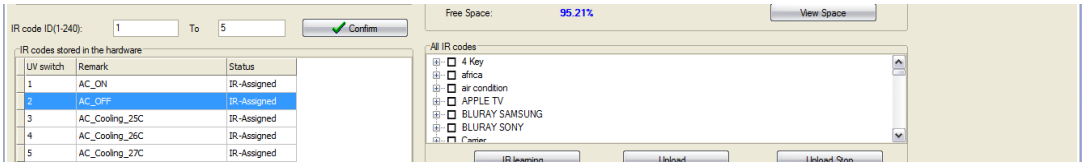


d) 3 minutes after people left the room, turn off the AC automatically

Set IR Sensor - ‘ No Movement’, delay time is 3 min, turn off AC when true.

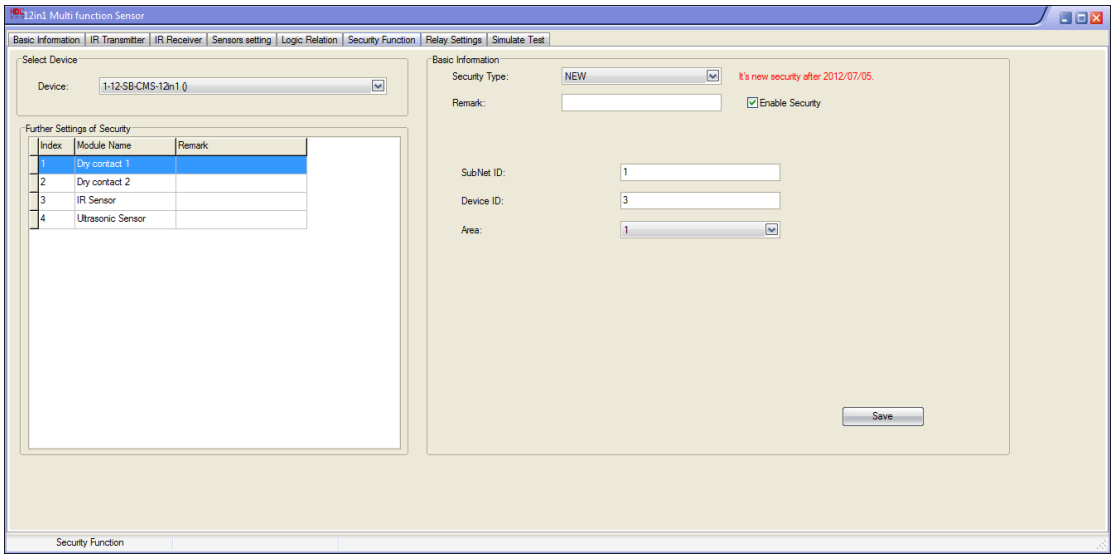

Logic Information
Power On Delay(0-120s):
Same Column
Logic No. Remark Enable Power OFF Recovery
1 turn on light Valid No Action
2 turn on AC Valid No Action
3 turn off light, AC27 Valid No Action
4 turn off AC Valid No Action
5
Logic Relation
Temp(C) From To
Brightness(Lux) From To
IR Sensor No Movement
Relation
OR
Logic True Delay 0-36000s(h:m:s):
Trigger Targets when true
Logic false Delay 0-36000s(h:m:s):
Trigger Targets when false
Save...
Logic Control Targets Infomation
Basic information
Data acquisition mode Device
Model SB-CMS-12in1
Subnet ID 1
Device ID 12
Remark
Current key No. 4
Modify subnet ID synchronously
Modify device ID synchronously
Modify type synchronously
Modify the intensity synchronously
Modify the running time synchronously
Logic Control Targets Infomation
Object no. Subnet ID Device ID Type Parameter 1 Parameter 2 Parameter 3
1 1 32 Universal switch 2(Switch no.) On(Switch Status) N/A
2 0 0 Invalid 255 255 N/A

Can check the UV Switch No. from IR Emitter, here OFF is UV Switch 2.



5.6 Security function

The states (connected/disconnected) of dry contacts, states (movement/no-movement) of IR sensor and states (present/absence) of ultrasonic sensor can be set as triggers to security module.



If use dry contact 1 to detect the door state for security, the setting steps as follow:

a) Select ‘dry contact 1’ here, its background will turn blue

b) Select ‘NEW’ if the security module firmware version is 2012/07/05 or after, select ‘OLD’ if the security module firmware version is before 2012/07/05.

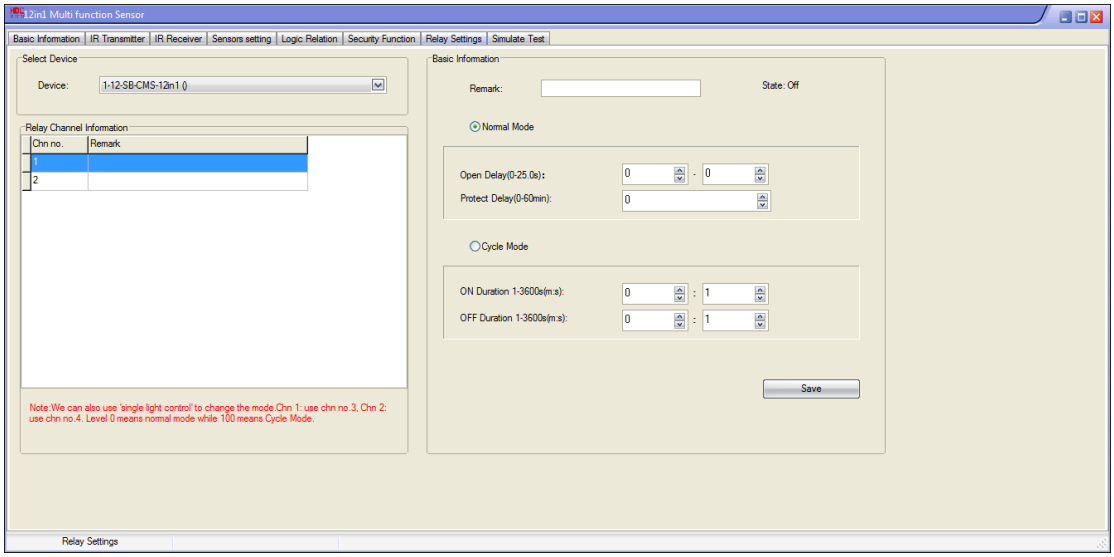
c) Enable security function

d) Input the security module’s Subnet/Device ID, totally 8 areas can be selected, here is area 1.

For further configuration, please turn to security module’s user manual.

5.7 Relay Settings

There are 2 relay channels in 12in1, and each channel has 2 modes , Normal Mode and Cycle Mode.



5.7.1 Normal Mode

- Open Delay

ON delay, setting range: 0-25.0s.

- Protection Delay

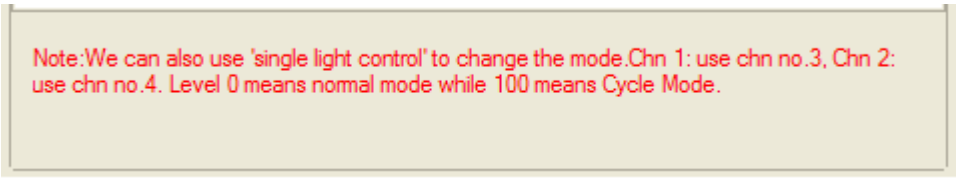
e.g. Set protection delay as 1 min(open delay as 0), now turn off relay, after 25s, you want to turn on it, it will not turn on until 35s later; setting range: 0-60min.

5.7.2 Cycle Mode

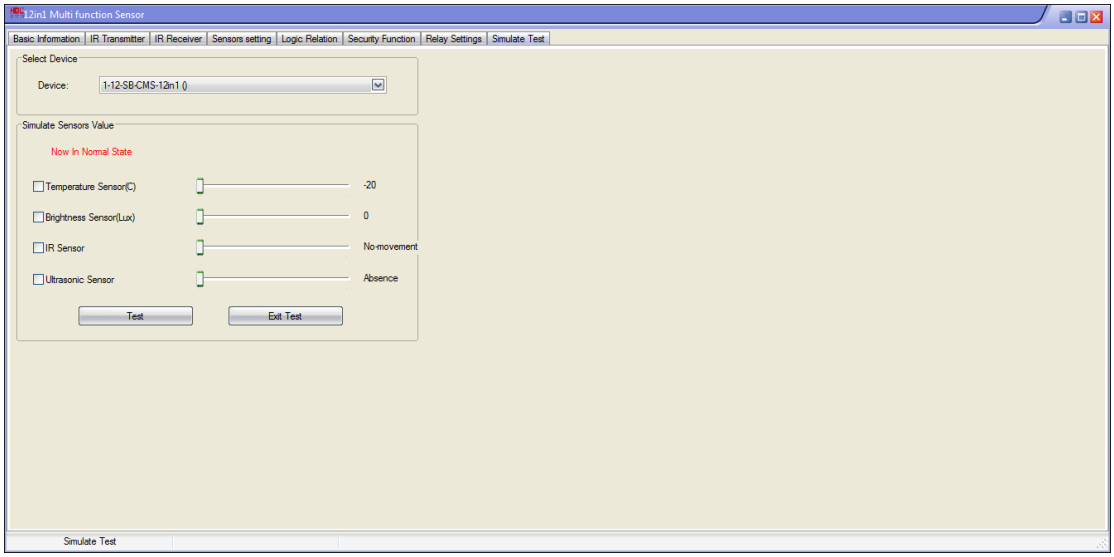
If you enable the cycle mode and set it on, it will automatically produce an “on-off-on-off” operation; setting range: 1-3600s.

5.7.3 Change Modes

Channel 3 and channel 4 are virtual channels, they are used to change the normal mode and cycle mode for channel 1 and channel 2:


Note:We can also use 'single light control' to change the mode.Chn 1: use chn no.3, Chn 2: use chn no.4. Level 0 means normal mode while 100 means Cycle Mode.

5.8 Simulate Test



You can simulate the logic you have set up by giving the sensors values or status. (When in simulate state, the real-time values will be bypassed and replaced by values you have given to them)

6. Note

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